MICROMETER READING MADE
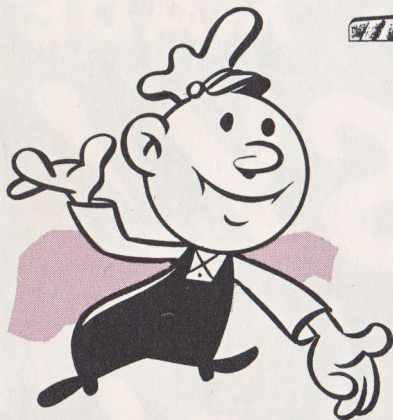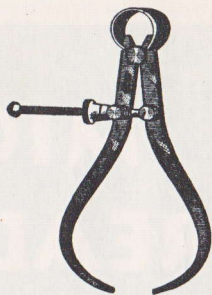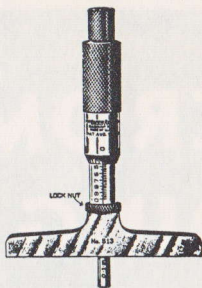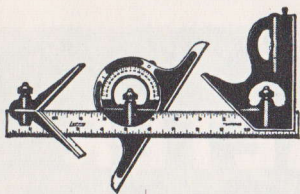
EASY!

THE LUFKIN RULE CO.

SAGINAW, MICHIGAN
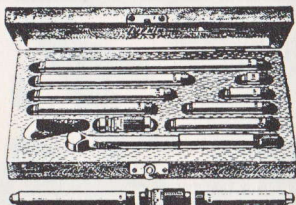
Today, accuracy of measurements is of first importance as mass production of almost everything, whether it be food or guns, clothing or ships, houses or planes, and so on, would be impossible without it.

Through the years, limits of measurements have been reduced and where 8ths, 16ths, 32nds and 64ths of an inch were widely used in the past, hundredths, thousandths and ten-thousandths of an inch are now in common use.

LUFKIN is proud to have contributed to this progress for "Accuracy of Measurement" has been a creed at LUFKIN for many generations. Furthermore, LUFKIN Precision Tools have been designed and perfected with the mechanic always in mind. Therefore, they bring to the user improved and exclusive features that assure accuracy, an important step in establishing his reputation as a master craftsman.

IT'S A MARK OF DISTINCTION

HALP!
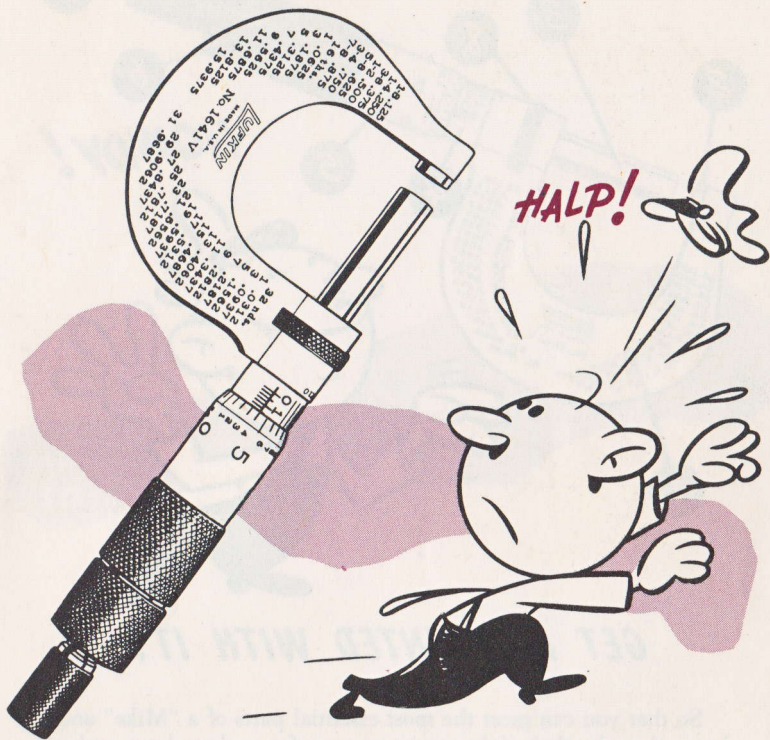
DON'T LET IT SCARE YOU!

It's as easy as dollars and cents to read a Micrometer. Just because it will split hairs, and then some, don't let it startle you.

In your hands it can be your most loyal servant for taking measurements of less than one-twentieth of the thickness of this piece of paper.

So, be kind to this sensitive tool. Don't abuse it. You'll find the "Mike" to be your *Magic Wand* — the key to all your precision measuring needs.
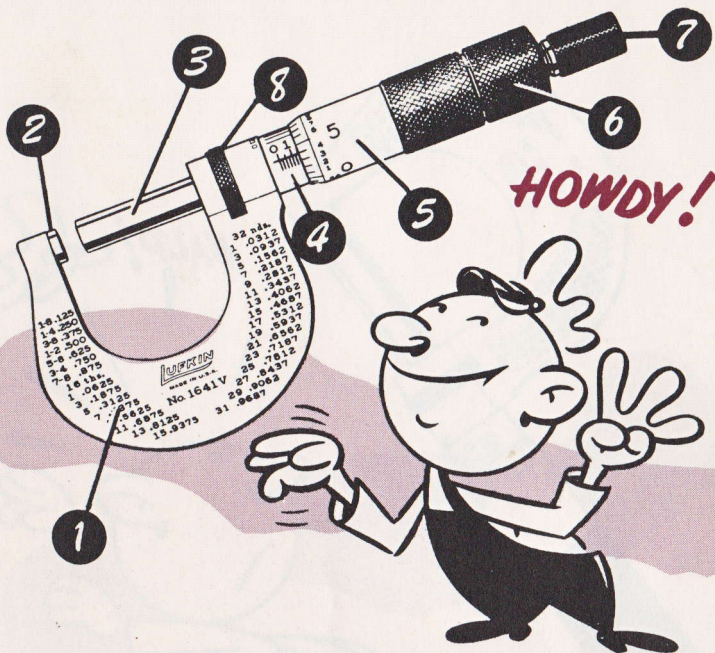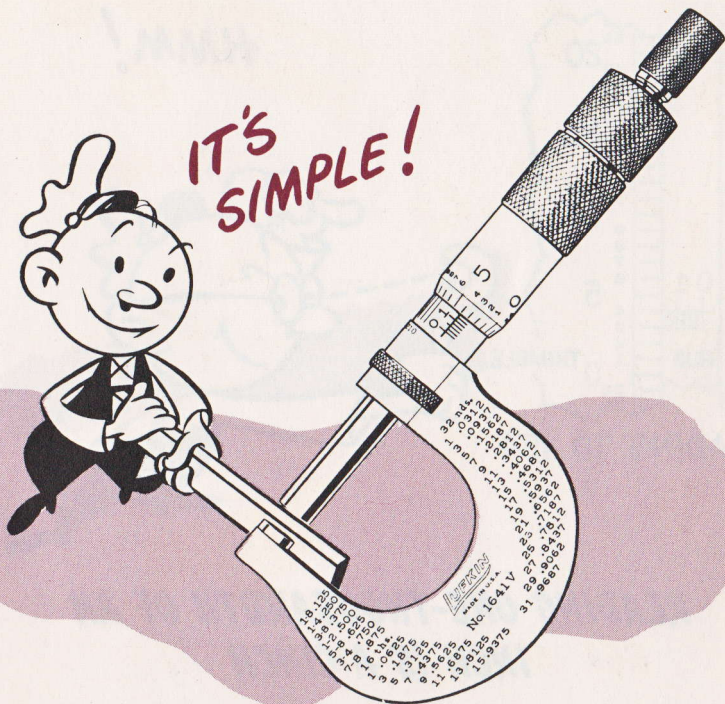
GET ACQUAINTED WITH IT!

So that you can meet the most essential parts of a "Mike" and know them by their right names, as we refer to them later, we've numbered the different parts as illustrated above.

The FRAME (1) is the foundation on which the micrometer is built. The ANVIL (2) is set in the Frame and is one of the contact faces for taking measurements. The end of the SPINDLE (3) is the other measuring face. The SPINDLE (3) is threaded in the HUB (4) permitting it to be turned to or from the part being measured. The THIMBLE (5) is fastened on the SPINDLE (3) and securely held by the LOCKING CAP (6). The RATCHET (7) permits a uniform pressure in taking readings. The LOCK NUT (8) holds SPINDLE (3) at any desired measuring position.

LUFKIN Micrometers have a "chrome clad" finish—the finish that is non-glaring and easier to read.

HERE'S HOW IT WORKS

The Spindle has 40 Precision Ground Threads per inch, so when the Thimble (which is attached to the Spindle) is given one complete turn, you have moved the Spindle 1/40th (.025) of an inch. As the Thimble is divided into 25 equal parts, the movement of one graduation of the Thimble, results in a one-thousandth change in reading, because 1/40th times 1/25th equals 1/1000th. Or, expressed in decimals, .025 × .040 = .001.

HMM!
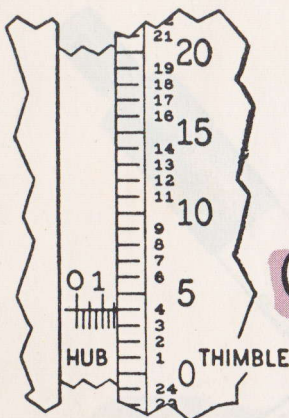
READING TO .154
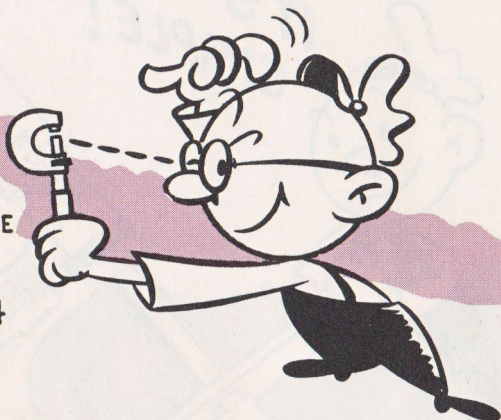
READING ONE-THOUSANDTH OF AN INCH IS A CINCH

To prove it—Let's think of the one-inch Micrometer as a ten dollar bill. A ten dollar bill is made up of a thousand pennies.

Look at the Hub. Above the straight line, you see figures 0 to 10. There being ten of them divides the hub into tenths (.1) or dollars. Between the numbers are four lines dividing the tenth (.1) dollar into quarters or (.025). The thimble has twenty-five numbered divisions. Each division represents one thousandth of an inch (.001) or pennies. Rotate the thimble to the second line past the figure 1 on the hub and match up the straight line on the hub with figure 4 on the thimble. Now let's add it all up. You have .150 on the Hub, or $1.50, and .004 on the thimble, or $.04.
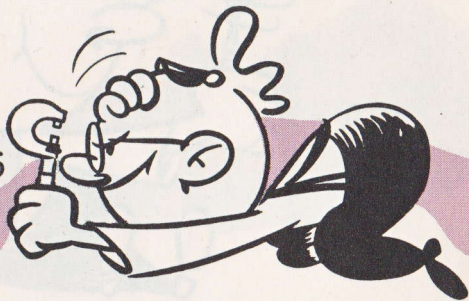
.150		$1.50
.004	or	.04
.154		$1.54
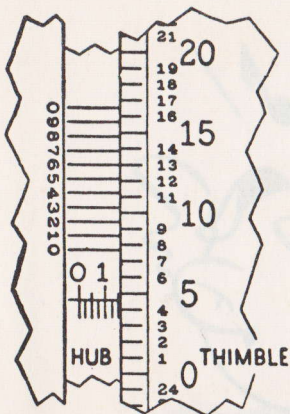
6TH LINE — COINCIDES WITH LINE ON THIMBLE

HAH!

READING TO .1546

LET'S TRY READING TO TEN THOUSANDTHS OF AN INCH

Reading to ten thousandths of an inch, means dividing the smallest measurements described on previous page (.001) by ten. This is done with the Vernier Graduations on the Hub. Here are ten numbered divisions, which permit dividing the .001 division by ten. To do this, find the graduated line on the Thimble that matches a numbered straight line on the Vernier—the number on that line is the ten-thousandth (.0001) reading. Example as shown in illustration:

|	
Hub reading is	.150
Thimble reading is . .	.004
Vernier reading is . .	.0006
Total	.1546″

EVERY MICROMETER MAY NEED ADJUSTING

With extensive use the "Mike" may need adjustment for wear on the faces of the Anvil and Spindle.

LUFKIN has the easiest method for making this adjustment. You simply loosen the cap, which locks the Spindle and Thimble together. A wrench is supplied with each micrometer for this purpose. Next grip the Spindle and turn the Thimble counter-clockwise about one quarter turn. Then release grip on Spindle and bring contact faces together. Turn Thimble clockwise until zero line on Hub and zero line on Thimble match perfectly. Now, grip Spindle carefully and turn it away from the Anvil. Hold the Thimble only and replace the cap securely.

OPEN WIDE!
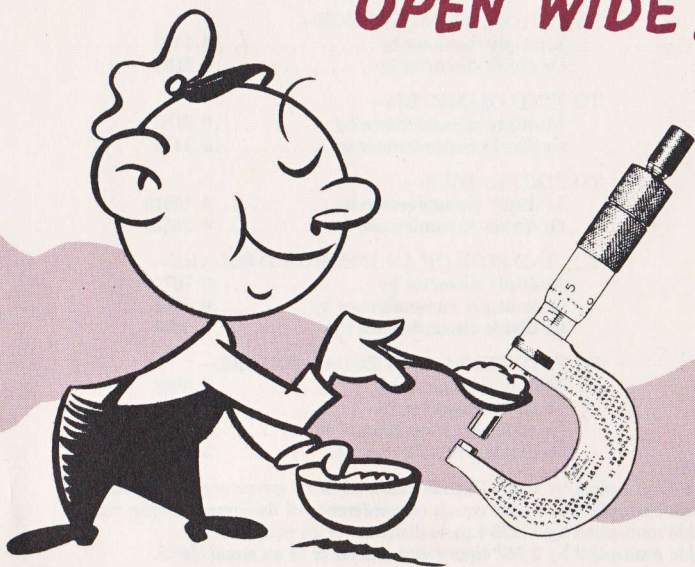
CARE AND FEEDING OF MICROMETER

The "Mike" deserves care. It is a Precision Tool for accurate measurements. Keep it clean and lightly oiled—avoid dirt getting into the threads or moving parts. The Anvil faces must be protected from damage and never "touched up" with emery cloth. If measuring faces become worn, they must be accurately lapped true and flat—then the Micrometer re-adjusted.

To move the Spindle a considerable distance—hold the frame in one hand and roll the Thimble in the palm of the other hand. Do not twirl the frame while holding the Thimble, as this may cause unnecessary wear.

A good mechanic soon learns to hold the "Mike" properly and to develop the right *"feel"* to secure correct readings.

USEFUL RULES

TO FIND CIRCUMFERENCE—
Multiply diameter by.................3.1416
Or divide diameter by................0.3183

TO FIND DIAMETER—
Multiply circumference by...........0.3183
Or divide circumference by..........3.1416

TO FIND RADIUS—
Multiply circumference by...........0.15915
Or divide circumference by..........6.28318

TO FIND SIDE OF AN INSCRIBED SQUARE—
Multiply diameter by.................0.7071
Or multiply circumference by.........0.2251
Or divide circumference by...........4.4428

TO FIND SIDE OF AN EQUAL SQUARE—
Multiply diameter by.................0.8862
Or divide diameter by................1.1284
Or multiply circumference by.........0.2821
Or divide circumference by...........3.545

SQUARE—
A side multiplied by 1.4142 equals diameter of its circumscribing circle.
A side multiplied by 4.443 equals circumference of its circumscribing circle.
A side multiplied by 1.128 equals diameter of an equal circle.
A side multiplied by 3.547 equals circumference of an equal circle.

TO FIND THE AREA OF A CIRCLE—
Multiply circumference by one-quarter of the diameter.
Or multiply the square of diameter by.................0.7854
Or multiply the square of circumference by.............07958
Or multiply the square of ½ diameter by...............3.1416

TO FIND THE SURFACE OF A SPHERE OR GLOBE—
Multiply the diameter by the circumference.
Or multiply the square of diameter by..................3.1416
Or multiply four times the square of radius by..........3.1416

TO FIND THE CUBIC INCHES (volume) IN A SPHERE OR GLOBE—
Multiply the cube of the diameter by .5236.

TO CONVERT TEMPERATURES—
To convert Centigrade to Fahrenheit:
Multiply by ⅗ and add 32.
To convert Fahrenheit to Centigrade:
Subtract 32 and multiply by ⅝.

TO FIND THE WEIGHT OF BRASS AND COPPER SHEETS, RODS AND BARS—
Ascertain the number of cubic inches in piece and multiply same by weight per cubic inch.

| Aluminum | .0924 | Copper | .3184 |
| Brass | .2960 | Steel | .2816 |

Or multiply the length by the breadth (in feet) and product by weight in pounds per square foot.

Decimal Equivalents of
8ths, 16ths, 32nds and 64ths of an inch

8ths

$\frac{1}{8} = .125$

$\frac{1}{4} = .250$

$\frac{3}{8} = .375$

$\frac{1}{2} = .500$

$\frac{5}{8} = .625$

$\frac{3}{4} = .750$

$\frac{7}{8} = .875$

16ths

$\frac{1}{16} = .0625$

$\frac{3}{16} = .1875$

$\frac{5}{16} = .3125$

$\frac{7}{16} = .4375$

$\frac{9}{16} = .5625$

$\frac{11}{16} = .6875$

$\frac{13}{16} = .8125$

$\frac{15}{16} = .9375$

32nds

$\frac{1}{32} = .03125$

$\frac{3}{32} = .09375$

$\frac{5}{32} = .15625$

$\frac{7}{32} = .21875$

$\frac{9}{32} = .28125$

$\frac{11}{32} = .34375$

$\frac{13}{32} = .40625$

$\frac{15}{32} = .46875$

$\frac{17}{32} = .53125$

$\frac{19}{32} = .59375$

$\frac{21}{32} = .65625$

$\frac{23}{32} = .71875$

$\frac{25}{32} = .78125$

$\frac{27}{32} = .84375$

$\frac{29}{32} = .90625$

$\frac{31}{32} = .96875$

64ths

$\frac{1}{64} = .015625$

$\frac{3}{64} = .046875$

$\frac{5}{64} = .078125$

$\frac{7}{64} = .109375$

$\frac{9}{64} = .140625$

$\frac{11}{64} = .171875$

$\frac{13}{64} = .203125$

$\frac{15}{64} = .234375$

$\frac{17}{64} = .265625$

$\frac{19}{64} = .296875$

$\frac{21}{64} = .328125$

$\frac{23}{64} = .359375$

$\frac{25}{64} = .390625$

$\frac{27}{64} = .421875$

$\frac{29}{64} = .453125$

$\frac{31}{64} = .484375$

$\frac{33}{64} = .515625$

$\frac{35}{64} = .546875$

$\frac{37}{64} = .578125$

$\frac{39}{64} = .609375$

$\frac{41}{64} = .640625$

$\frac{43}{64} = .671875$

$\frac{45}{64} = .703125$

$\frac{47}{64} = .734375$

$\frac{49}{64} = .765625$

$\frac{51}{64} = .796875$

$\frac{53}{64} = .828125$

$\frac{55}{64} = .859375$

$\frac{57}{64} = .890625$

$\frac{59}{64} = .921875$

$\frac{61}{64} = .953125$

$\frac{63}{64} = .984375$

How To Read A Micrometer

THE LUFKIN RULE COMPANY

You may obtain a copy of our No. 8 Catalog showing the complete line of LUFKIN precision tools by contacting your local Tool or Hardware dealer, or by sending your request direct to the factory at Saginaw.

If you would like to have an attractive illustrated poster on *"How to Read a Micrometer"* for your shop, have your Supervisor send for a copy on your company or school stationery.

THE LUFKIN RULE CO.

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